Topic 06 – Hypertension/vascular disease

January 14th, Thursday 2010

234

Evaluation of left ventricular function in patients with Marfan syndrome using conventional Doppler-echocardiography, tissue Doppler and two-dimensional strain imaging

Delphine Detaint (1), Yuliya Korinenko (2), Mathieu Gauthier (1), Florence Arnoult (1), Gabriel Delorme (1), Catherine Bouffard (1), Guillaume Jondeau (1)
(1) Hopital BICHAT, Paris, France – (2) Mayo Clinic, Rochester, Etats-Unis

Background: Early impairment of left ventricular systolic and diastolic function in Marfan syndrome (MFS) has been suggested but remains uncertain.

Methods: 179 patients were consecutively screened for MFS. Diagnosis was confirmed in 92, ruled out in 35 and uncertain in 52. Clinical and echocardiographic characteristics of 35 Healthy and 79 MFS patients were compared. Patients with previous surgery or ongoing pregnancy were excluded.

Results: Groups were comparable for age and gender (mean age 31±14, male,45%). Overall MFS compared with healthy patients had larger aortic dimensions (Valsalva 41±7 vs 36±4mm, p<0.001), left ventricular volumes (end diastolic (EDV) 118±33 vs 86±26mL, p<0.01 and end systolic (ESV) 43±15 vs 30±9mL, p<0.01), diastolic dimensions (51±1 vs 48±1, p=0.04) and tended to have larger LV systolic dimensions(p=0.06). Adjustment for BSA lessened differences between groups but EDVI and ESVI remained significantly larger in MFS than healthy patients (both p<0.01). No difference in fractional shortening, Teicholz and Simpson ejection fraction was observed between groups (for all p=NS). Assessment of diastolic function with E/A and deceleration time showed no difference between groups (for all p=NS). However MFS compared with controls had lower early diastolic (Ea: 9.7±3 vs 14.5±4cm/s, p<0.001) and systolic velocities (Sm:8.5±2 vs10.2±3cm/s, p=0.003). Despite lower velocities, global and regional longitudinal systolic function (P=NS for all) quantified by 2D strain was not different between groups.

These cardiac abnormalities observed in MFS increased with the severity of the aortic root dilatation (table).

Conclusion: In comparison with controls MFS patients have apparent similar systolic and diastolic LV function. However comprehensive echocardiographic evaluation using most of the available current tools shows mild impairment of LV function, which seems related to the degree of aortic root involvement.

Variables	Controls	MFS with Valsalva≤40mm	MFS with Valsalva>40mm	P value
Sm cm/s	10 ± 3	9 ± 2	8 ± 2	P=0.002
Ea cm/s	15 ± 4	11 ± 4	9 ± 2	P<0.001
EDVI mL/m^2	50 ± 12	53 ± 12	69 ± 16	P<0.001
ESVI mL/m^2	17 ± 4	19 ± 5	26 ± 8	P=0.0004

235

Pulse wave velocity assessment by external non-invasive devices and phase contrast magnetic resonance imaging in obese subjects

Laure Joly (1), Anna Kearney-Schwartz (1), Paolo Salvi (1), Damien Mandry (2), Ghassan Watfa (1), Gilles Karcher (3), Pierre-Yves Marie (3), Faiez Zannad (4), Athanase Bénétos (1)
(1) CHU Nancy, Gériatrie et Médecine Interne, Vandoeuvre Les Nancy, France – (2) CHU Nancy, Département de Radiologie, Vandoeuvre Les Nancy, France – (3) CHU Nancy, Médecine Nucléaire, Vandoeuvre Les Nancy, France – (4) CHU Nancy, Hôpital de Toul, Centre d'Investigation Clinique et Thérapeutique de Nancy, Nancy, France

Carotid-femoral pulse wave velocity (PWV) is considered as the "gold-standard" measurement of arterial stiffness. Obesity can render inaccurate PWV measurement by external non-invasive devices. This concerns both difficulties in obtaining pressure curves of good quality and technical difficulties in the measurement of distance. Phase-contrast magnetic resonance imaging (PCMRI), permits to determine aortic PWV in multiple aortic locations with intra arterial distance measurements and to assess aortic mechanical properties.

The purpose of this study is to assess the reliability of external carotid-femoral PWV values measured by external well-validated devices, compared to PCMRI acquisitions of PWV and aortic mechanical properties in a population of obese subjects.

PWV was measured with PulsePen and Complior II devices, in 32 volunteers (18 men), aged 46 to 65 years (mean: 55.7±5.1 ys), presenting an isolated abdominal obesity, waist circumference >102 cm for men and >88 cm for women and BMI from 27-35. These results were compared to the values of PWV and cross-sectional MRI thoracic aorta distensibility values.

MRI PWV were correlated to PWV measured with Pulse Pen (r=0.47, p=0.005) and Complior (r=0.43, p=0.01). Also, cross-sectional thoracic aorta MRI distensibility was inversely correlated with Pulse Pen PWV (r= -0.41, p=0.02), and the same trend was found with Complior PWV (r= -0.33, p=0.06). The observed relationships were significant even after adjustment for age, gender, BMI and MAP.

This is the first study to compare transcutaneous PWV measurements to PCMRI aortic elastic properties in obese subjects. Our results indicate that for BMI values up to 35 kg.m^{-2}, PWV measured externally with Complior or Pulse Pen reflects values obtained directly in the thoracic aorta with MRI.

236

The effects of dipper and non dipper status on heart rate variability and heart rate turbulence in essential hypertension

Afef Ben Halima (1), Mehdi Ben Miled (2), Manel Ben Halima (3), Khedija Mzoughi (4), Rym Chrigui (5), Salem Kachboura (5)
(1) Abderrahmen Mami university Hospital, cardiologie, Ariana, Tunisie – (2) abderrahmen Mami Hospital, Ariana, Tunisie – (3) abderramen mami Hospital, Ariana, Tunisie – (4) Abderrahmen Mami hospital, Ariana, Tunisie – (5) Abderrahmen mami hospital, Ariana, Tunisie

Introduction: The relation between the autonomic nervous system and the circadian pattern of blood pressure in hypertensive patients is not well established.

Aim: the aim of this prospective study is to compare parameters of heart rate variability (HRV) and heart rate turbulence (HRT), non invasive measures reflecting the sympathetic and parasympathetic modulations of heart rate, in dipper and non dipper hypertensive patients.

Methods: 47 hypertensive patients (24 males and 23 females, age = 57 ± 10 years old) underwent 24 hour Holter recording and 24 hour ambulatory blood pressure monitoring (ABPM). Patients whose nocturnal average blood pressure (BP) levels decreased by more than 10 % compared to their day time BP levels were considered as dippers, and those whose levels did not decrease as non dippers. Diabetes and ischemic heart disease were exclusion criteria.

Results: 30 patients were dippers and 17 patients were non dippers. Dipper and non dipper patients were comparable regarding age, sex and mean blood pressure. There was no significant difference in average HRV and HRT parameters between both groups (table 1).

Table. Comparison of HRV and HRT parameters

	Dippers N = 30	Non dippers N = 17	P
SDNN 5 min (ms)	53 ± 5	47 ± 3	NS
SDANN 5 min (ms)	106 ± 35	97 ± 24	NS
RMSSD (ms)	38 ± 31	31 ± 13	NS
LF (ms^2)	620 ± 146	411±134	NS
HF (ms^2)	387 ± 133	194 ±32	NS
TO (%)	-0.0244	-0.0152	NS
TS (ms/RIR)	7.72 ± 1.97	7.43 ± 1.36	NS